

# Making driving energy visible

## The Physics of Driving

Fuel consumption is defined by:

$$P = mv \cdot (a_+ + g(\mu + \sin \alpha)) + \frac{1}{2} \rho \cdot A \cdot c_d \cdot v^3$$

- Engine characteristics
- Aggregate (electric, air condition, etc.)
- External & internal forces:
  - Standstill
  - Acceleration (positive)
  - Rolling Friction
  - Grade
  - Air drag (aerodynamics)
- All forces are speed related and can be estimated by simple GPS profiles after transmission by smart phones to Internet platforms for online monitoring

